Five million year record of summer monsoon winds and continental aridity from The Maldives carbonate platform (IODP Site U1467)

*Dirk Kroon¹, Tereza Kunkelova¹, Simon Jung¹, Erica Sandra de Leau¹, Nick Odling¹, Silvia Spezzaferri², Stefanie Hayman², Andres Rüggeberg², Montserrat Alonso Garcia³, Jim Wright⁴, Carlos Alvarez Zarikian⁵, Christian Betzler⁶, Gregor Eberli⁷, Luigi Jovane⁸, Juan Layá⁹, Anna Ling Hui-Mee⁷, John Reijmer¹⁰, Juan Reolid⁹, Craig Sloss¹¹

1. School of GeoSciences; University of Edinburgh; Scotland, 2. Earth Sciences; Université de Fribourg; Switzerland, 3. Instituto Portugues do Mar e da Atmosfera (IPMA), Lisboa, and Centro de Ciências do Mar (CCMAR), Universidade do Algarve, Faro, Portugal, 4. Department of Geological Sciences, Rutgers, USA, 5. IODP, Texas A&M University, College Station, TX 77845, USA, 6. Institute of Geology, CEN, University of Hamburg, Germany, 7. Department of Marine Geosciences, University of Miami, USA, 8. Instituto Oceanográfico da Universidade de São Paulo; Praça do Oceanográfico, 191, Brazil, 9. Department of Geology and Geophysics, Texas A&M University, College Station, 10. College of Petroleum Engineering and Geosciences, KFUPM, Dhahran, Saudi Arabia, 11. School of Earth, Environmental and Biological Sciences, Queensland University of Technology, Brisbane Australia

Strong winds and the proximity of arid source-areas result in a large flux of desert dust from the continents to the Arabian Sea in summer. This research identifies the main controls on dust influx into the northern Indian Ocean over the last 5 million years by analyzing the first high resolution marine sediment record from The Maldives carbonate platform (IODP Expedition 359; Site U1467), an area strongly affected by the monsoon seasons. Here we present variations in the concentration of specific normalized elements (e.g. Fe/Al, Si/Al), from X-ray fluorescence spectrometry, reflecting variations in the dust flux. We investigate the degree of coupling between the new dust record and Earth’s climate in the northern hemisphere. This research paves the way for understanding hominin migration pathways from Africa to Asia.

Keywords: monsoon records, dust, ITCZ, Maldives, hominin migration routes